

Financial Management Modernization Initiative (FMMI)

FMMI 302 – FMMI BI Navigation





Course Outline



- **Course Introduction**
- Module 1 – FMMI BI Overview
- Module 2 – FMMI BI Navigation
- Course Summary
- Course Evaluation



Welcome to FMMI General Ledger Overview



The BI Navigation course will provide you an introduction to the information needed to understand the navigation process in FMMI.





Course Objectives



After completing this course, you will be able to:

- Explain the concept and components of FMMI Business Intelligence (BI)
- Explain BI capabilities and associated benefits
- Define BI key terminology
- Explain BI data architecture
- Access and execute BI reports





Introduction Module Overview



Before you get started with the course modules, review the next slides. The next slides include:

- Review of the content covered in FMMI 101 – Introduction to FMMI
- Review of the content covered in the FMMI 200 level courses
- Review of the FMMI Curriculum



Introduction to FMMI (100 Level) Review



As a prerequisite to the 200 Level courses, you participated in the FMMI 101 - Introduction to FMMI course. FMMI 101 provided a high-level overview of the FMMI project, changes and impacts of the implementation, and benefits of the new system.

After completing the 100 Level course, you learned to:

- Summarize the FMMI program objectives
- Explain the benefits and advantages FMMI provides
- Describe an Enterprise Resource Planning (ERP) solution
- Explain new business processes and concepts
- Explain the key implementation timeline and milestones
- Explain what organizations are impacted by each release of FMMI

The 200 Level Process Overview courses takes a step further and provides you a high-level overview of FMMI's new terminology and business processes.



Process Overview (200 Level) Review



As a prerequisite to the 300 Level course, you participated in the 200 Level courses. The 200 Level Process Overview courses take a step further and provides you a high-level overview of FMMI's new terminology and business processes.

After completing the 200 Level courses, you learned to:

- Provide an overview of the FMMI business processes
- Explain the Master Data Maintenance end-to-end processes
- Explain the organizational elements within each of the process areas
- Describe the process flow, business activities, and roles within of the processes
- Explain the key terminology associated with each of the processes
- Describe the various reports

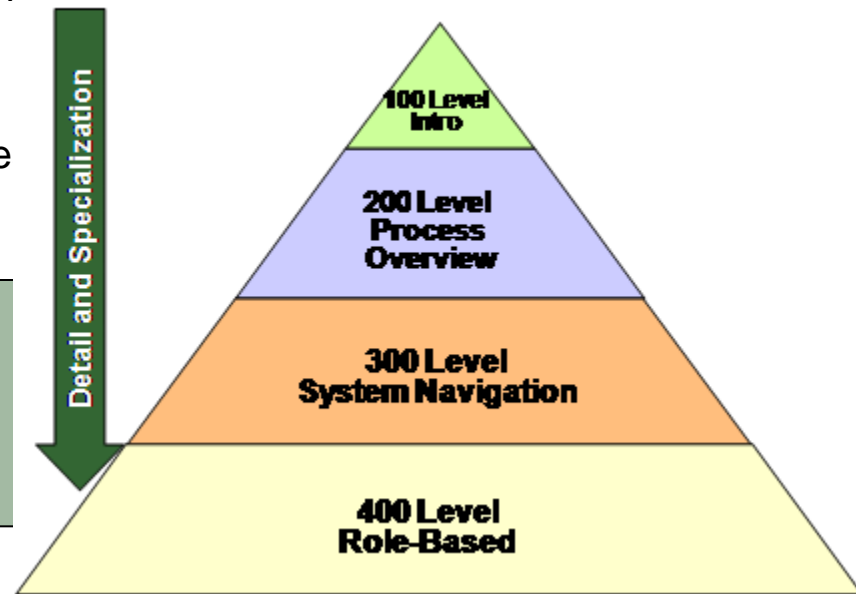


Your Curriculum



The FMMI Training curriculum outlines the training required for FMMI User Roles. The training courses provide an understanding of the FMMI program and application(s) and the USDA financial processes.

- **Introduction to FMMI (100 Level)**
 - Overview of the FMMI project
 - Instructor-led course, delivered in an auditorium or via teleconference
- **Process Overview (200 Level)**
 - High-level view of USDA's core financial processes
 - Web-based course, delivered via AgLearn Learning Management System
- **System Navigation (300 Level)**
 - Hands-on practice navigating the FMMI system
 - Web-based course, delivered via AgLearn Learning Management System
- **Role-Based (400 Level)**
 - Hands-on training and detailed introductions on how to process transactions in the FMMI system
 - Instructor-led course, delivered in a computer-based classroom





Introduction Module Summary



Congratulations! You have completed the Introduction module. The next few modules provide you an overview of Business Intelligence (BI) in FMMI.





Course Outline



- Course Introduction
- **Module 1 – FMMI BI Overview**
- Module 2 – FMMI BI Navigation
- Course Summary
- Course Evaluation



Welcome to Module 1: FMMI BI Overview



- This module will provide you an overview of FMMI Business Intelligence (BI)
- Proceed to each new page by clicking the **Next** button when you have finished reading the content on a page
- To view a full list of the topics covered in this module, click the Menu button on the top right corner of the course
- When you are finished with the Module, click **Exit** to mark the module complete and return to AgLearn





Objectives



After completing this module, you will be able to:

- Explain Business Intelligence (BI) key terms
- Define Business Intelligence
- Explain the differences between ECC Reporting and BI Reporting
- Describe the data refresh schedule
- Describe key Business Intelligence benefits
- Explain the Business Intelligence data architecture components
- Define the BI security controls
- Explain the difference between Data Store Object (DSO) and InfoCube Reporting
- Describe the Business Intelligence roles





What is Business Intelligence?



Business Intelligence is a collection of technologies, applications, and practices that provide decision support capabilities through efficient, quality, and fact-based analytics, metrics, and reporting.

FMMI BI:

- Consists of components for data management and modeling, analytical, and operational tools
- Is an end-to-end Data Warehouse solution that allows operational data analysis from FMMI
- Allows data extract and analysis from external sources such as legacy systems as well as FMMI ERP Central Component (ECC)
- Does not affect the data integrity of the source system and does not provide real-time data – ECC data is batch loaded into BI on a nightly basis



Key Terminology



Let's review the following terms and definitions before beginning the FMMI BI Overview module:

- **Characteristic**: Type of InfoObject that is a logical group such as Company Code, Material Vendor, G/L Account, etc.
- **Data Store Object (DSO)**: Data storage container (database table) that contains detailed data from FMMI ECC or other systems (e.g., PACS, CAPS, ABCO)
- **Drill-down**: Navigation technique that provides the capability to display characteristics and key figures in rows or columns. It allows for additional information and/or detail to be viewed
- **Filter**: Data value that can be selected during Query navigation and restricts the data returned in the report



Key Terminology Continued



- **Free Characteristic**: Characteristic not displayed initially in the results area of the report but are available (“free”) to be added to the results area of the report
- **InfoCube**: Data storage container optimized for building queries that contain Key Figures and Characteristics
- **InfoProvider**: General term for BI objects into which data can be loaded or which represent a view of data, such as those objects that contain physical data (e.g., DSO, InfoCubes, InfoObjects) and those that are not physical data stores (e.g. InfoSets and MultiProviders)
- **InfoSet**: Virtual joins of like data from multiple InfoProviders collected for reporting



Key Terminology Continued

- **Key Figure**: Value or quantity such as Budget Amount
- **InfoObject**: Individual data elements subdivided into Characteristics, Key Figures, Units, and Time
- **MultiProvider**: Virtual union of data from multiple InfoProviders collected for reporting
- **Online Analytical Processing (OLAP)**: Functionality available in the results area of the report to analyze data and customize a report
- **Query**: Data evaluation based on the selection of Characteristics and Key Figures



BI Reporting



BI reports offer additional analytical flexibility and options to end users, beyond the capabilities provided by ECC reports.

- BI can quickly generate summarized and detailed reports and can easily generate multiple views of the same report and data
- BI report formats are more dynamic – users can add or remove certain report fields to suit their individual reporting needs, providing the ability to save these views into the BI portfolio for later retrieval
- Because BI is an analytical tool, users can manipulate the same set of data into different ways
- Whenever possible, users should run queries using BI instead of ECC to optimize FMMI system performance
- Since BI data is batch loaded nightly, there is a one day delay in the information displayed in the BI reports. ECC reports are real-time



ECC Reporting Vs. BI Reporting



	ECC Reporting	BI Reporting
Availability of Data	Real-time reporting available	Batch load of data nightly
Analytical Capabilities	Some analytical capabilities are available (e.g., drill-down, filtering)	Advanced analytical capabilities are available (e.g., slice and dice, drill-down, and exception/conditional reporting)
Customization of View by End User	Limited ability to customize the report layout	Several functions available to customize the layout of the report as needed
Ability to Print Reports via the Web	Printing is available by downloading to Microsoft Excel	Printing is available in Adobe Acrobat or downloading to Microsoft Excel
Download Capabilities	Several platforms	Microsoft Excel/Adobe Acrobat/ Comma Separated Values (CSV) File
Distribution of Reports	Reports are available via the FMMI Portal	Reports are available via the FMMI Portal
Integration of Data	ECC module specific reporting	Flexibility to report on data from multiple ECC modules and external data

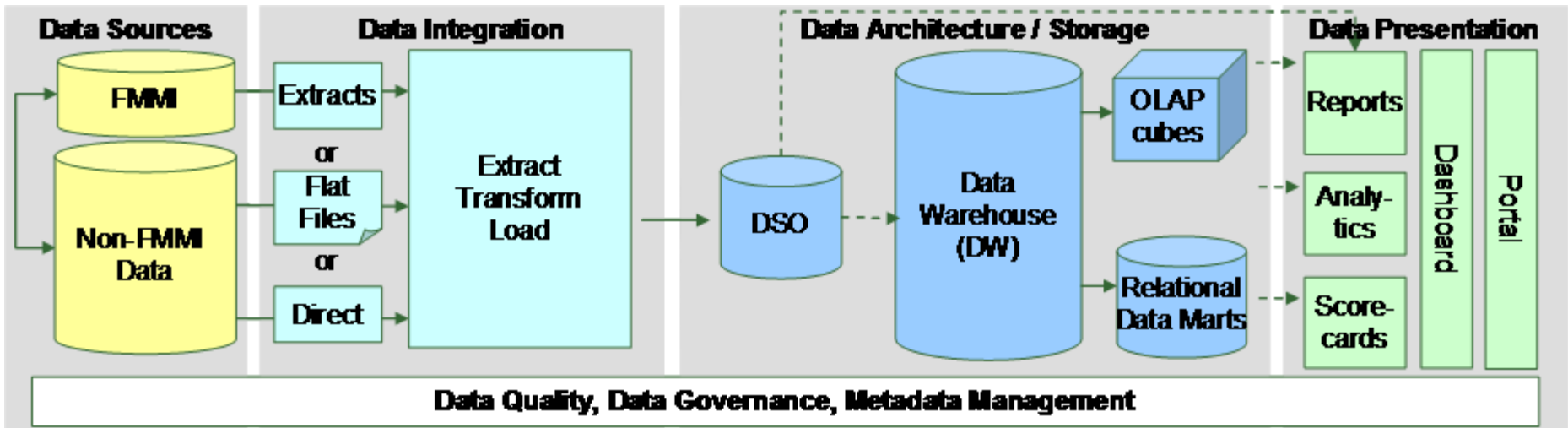


Key Business Intelligence Benefits



- Quantitative Benefits:
 - Reduced data latency
 - Reduced IT effort to maintain systems
 - Reduced business effort to maintain hierarchies and master data
- Qualitative Benefits:
 - Ability to operate as a single enterprise with common processes and systems; data represents “one version of the truth”
 - More timely, accurate, and complete financial and management information that is transparent across agencies and staff offices
 - Reduce user time spent on data retrieval and gathering by storing data in one central place
 - Ability to refocus finance personnel on analysis and more value added tasks
 - Improved data accuracy and integrity
 - Improved decision support
 - Ability to grow and evolve BI solution using one standard platform

BI Data Architecture Components



Enterprise systems that support day-to-day business operations. They are the source of data used in Business Intelligence solutions.

Set of processes that copy / extract, capture, integrate, transform, cleanse, summarize and load source data into the data warehouse and operational data store.

Extracts – FMMI modules that enable extraction of data from core ERP platform.

Flat files – Source system creates flat file extract

Direct connect – Results retrieved via query run directly against source system

Data Store Object (DSO) – Collection of frequently-updated detailed data used to support tactical reporting needs

Data Warehouse (DW) – Integrated, time-variant, non-volatile collection of data; the central point of data integration; delivers a common view of enterprise data

OLAP Cubes – Multi-dimensional data structures built to support the specific analytic needs of business processes and departments

Relational Data Marts – Subsets of the DW created to support specific reporting and analysis needs

Reports – Standard results w/ limited interactivity

Analytics – Advanced reporting with slice-and-dice, drill-down, and filtering capabilities

Scorecards – High-level metrics summaries

Dashboard – Presentation of multiple result formats

Portal – Primary method of accessing various end-user tools



BI Data Architecture Components Continued



- Non – FMMI Data sources include Payroll data from PACS, CAPS, and ABCO
- Scorecards and Dashboard will be available at a subsequent deployment
- Power users will have access to Business Objects to create Ad-Hoc reports. This will be covered in greater detail in FMMI 404 – Payroll Reporting and FMMI 405 – Ad-hoc Reporting

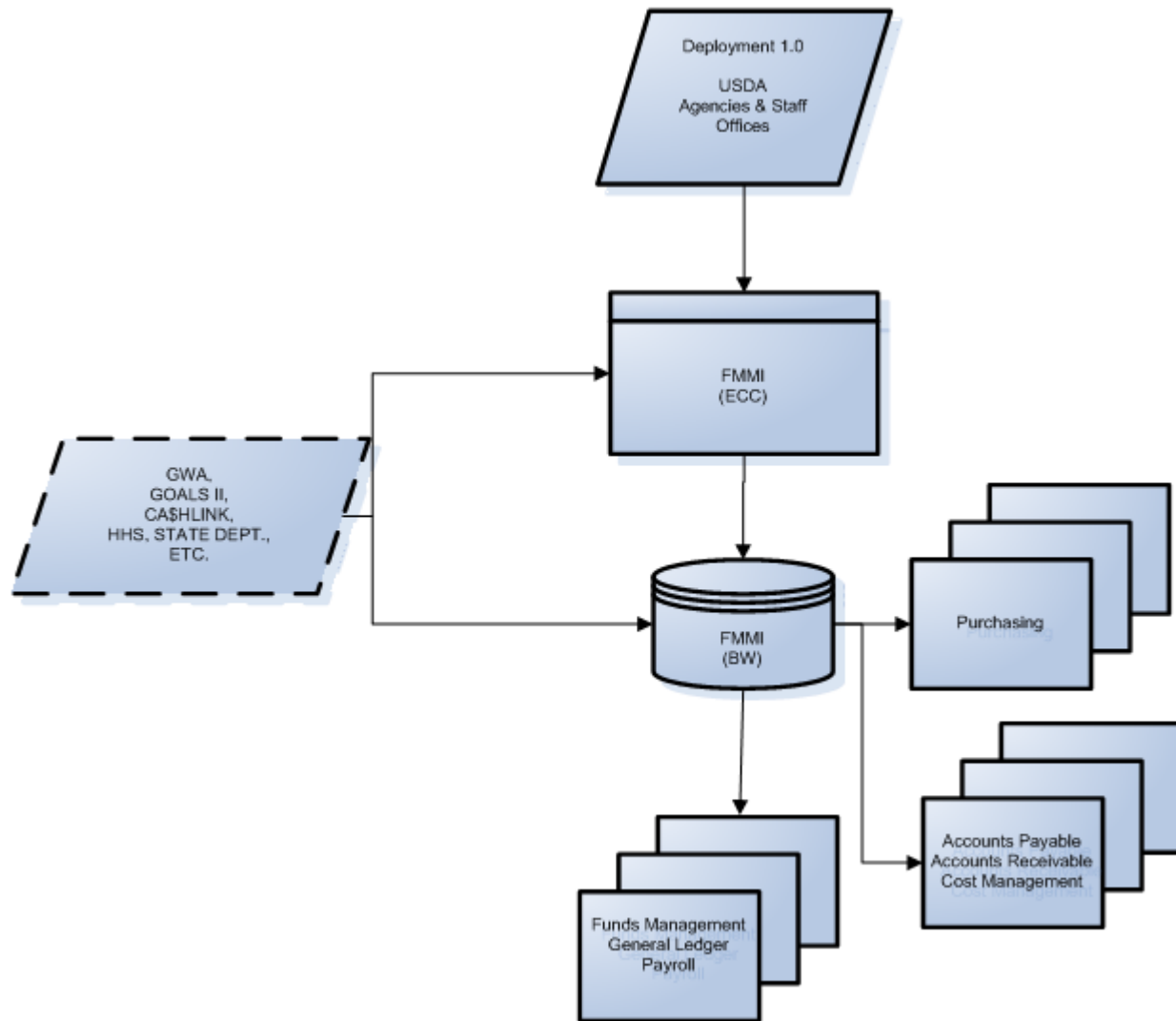


FMMI Reporting Landscape



USDA Agencies and State Offices using FMMI will use BI & ECC for reporting in the following areas:

- Accounts Payable
- Account Receivable
- Cost Management
- Funds Management
- General Ledger
- Purchasing
- Payroll
- Cash Reconciliation





BI Data Security Overview



- BI security restricts the reports available and the dataset displayed for the reports
- Available data depends on the end user's role
- There are two main types of roles:
 - End User "Reporter" – Can execute available reports
 - Power User – Can modify and create reports, a functionality also known as ad-hoc analysis
- Agency-level security is controlled by the FMMI accounting elements
 - E.g., Fund and Fund Center
 - For example, Homeland Security agency has access to only their agency specific data





Data Store Object (DSO) vs. InfoCube Reporting



- Detailed reports are generally built off of the DSO, while high-level, summary type reports are normally built off of an InfoCube
 - In this example, if the query is written from the DSO, the report output will detail the item, size, color and dollar amount sold
 - Conversely, if the query is written from the InfoCube, the data reflected in the report output will aggregate the data to reflect the dollar amount sold for each size

Shirts Sold				
Item	Size	Color	DSO (Detailed Data)	InfoCube (Aggregated Data)
Shirt	Small	White	\$1,000.00	Small = \$3,600.00
Shirt	Small	Tan	\$1,200.00	
Shirt	Small	Blue	\$1,400.00	
Shirt	Medium	White	\$1,200.00	Medium = \$4,200.00
Shirt	Medium	Tan	\$1,400.00	
Shirt	Medium	Blue	\$1,600.00	
Shirt	Large	White	\$1,400.00	Large = \$4,800.00
Shirt	Large	Tan	\$1,600.00	
Shirt	Large	Blue	\$1,800.00	



FMMI User Roles



- Role Alignment is the process of defining FMMI User Roles required to obtain system access to perform the FMMI business processes
- Once roles are defined, FMMI users are aligned to them
- Proper role definition and alignment:
 - Ensures users have access to perform the tasks needed to perform FMMI transactions
 - Ensures proper segregation of duties
 - Ensures FMMI users receive proper training
- An individual user may be assigned one or more FMMI roles based on his or her responsibilities
- Upcoming modules further explain FMMI user roles





User Roles (Continued)



FMMI Business Intelligence (BI) includes the following roles:

Role Name	Function
BI Reporter	<ul style="list-style-type: none">■ View and execute non-payroll BI reports in the FMMI-BI system
BI Payroll Reporter	<ul style="list-style-type: none">■ View and execute the payroll related BI report in FMMI-BI system
BI Power User	<ul style="list-style-type: none">■ Create ad-hoc BI non-payroll reports in the FMMI-BI system■ Execute BI non-payroll reports in the FMMI-BI system
BI Payroll Power User	<ul style="list-style-type: none">■ Create ad-hoc BI payroll reports in the FMMI-BI system■ Execute BI payroll reports in the FMMI-BI system





Learning Checkpoint Question and Answer (Q&A)



- Now is your opportunity to see if you are learning the course material
- If you answer the questions incorrectly, please be sure to reference the course if you need more explanation about key concepts





Learning Checkpoint Question and Answer (Q&A)



1. **True/False:** FMMI BI is an end-to-end Data Warehouse solution that allows operational data analysis from FMMI. (*True*)
2. **Multiple Choice:** Which of the following is a benefit of Business Intelligence?
 - a. Reduced data latency
 - b. Reduced IT effort to maintain systems
 - c. Improved data accuracy and integrity
 - d. Improved decision support
 - e. *All of the Above*
3. **True/False:** BI reports provide real-time data. (*False*)



Learning Checkpoint Question and Answer (Q&A)



4. **True/False:** The FMMI portal is the primary method of accessing BI reports. (*True*)
5. **Multiple Choice:** Which of the following users can create ad-hoc BI payroll reports in the FMMI-BI system?
- a. Financial Reporter
 - b. BI Reporter
 - c. BI Payroll Reporter
 - d. BI Power User
 - e. ***BI Payroll Power User***



Module Summary



In this module, you have learned to:

- Explain Business Intelligence (BI) key terms
- Define Business Intelligence
- Explain the differences between ECC Reporting and BI Reporting
- Describe the data refresh schedule
- Describe key Business Intelligence benefits
- Explain the Business Intelligence data architecture components
- Define the BI security controls
- Explain the difference between Data Store Object (DSO) and InfoCube Reporting
- Describe the Business Intelligence roles





Module Completion



Congratulations! You have completed Module 1 – FMMI BI Overview. The next module provides you an overview of the FMMI BI Navigation process.





Course Outline



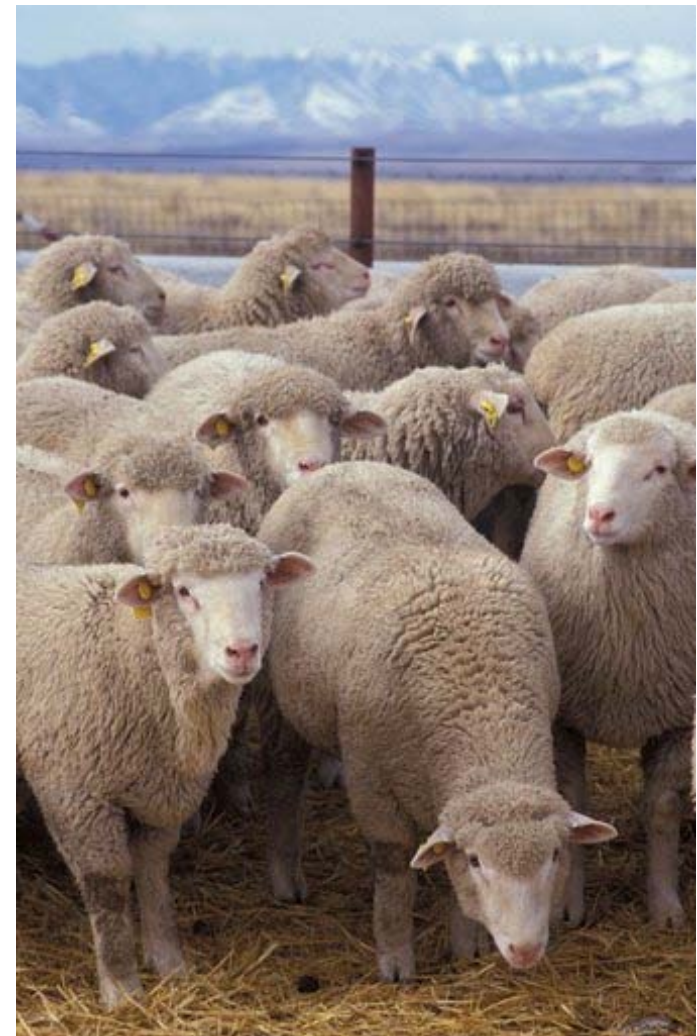
- Course Introduction
- Module 1 – FMMI BI Overview
- **Module 2 – FMMI BI Navigation**
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Welcome to Module 2: FMMI BI Navigation



- This module will provide you an overview of FMMI BI navigation
- General Ledger Master Data process
- Proceed to each new page by clicking the **Next** button when you have finished reading the content on a page
- To view a full list of the topics covered in this module, click the Menu button on the top right corner of the course
- When you are finished with the Module, click **Exit** to mark the module complete and return to AgLearn





Objectives



After completing this module, you will be able to:

- Navigate through the FMMI Portal to BI reports
- Navigate within BI reports
- Explain Online Analytical Processing (OLAP) functionality
- Create a report variant
- Export a report to MS Excel
- Save and print reports





Key Terminology



Let's review the following terms and definitions before beginning the FMMI BI Navigation module:

- **BEx Web Analyzer**: An analytical tool to create and display BI Reports
- **FMMI Portal**: Web-based single point of entry into FMMI
- **FMMI Role**: The system access provided to FMMI users to perform various business activities
- **Process Area**: A major grouping of activities in a process area that enables users to perform their work in the FMMI environment



BI Key Figures and Characteristics



BI reports include Key Figures and Characteristics that contain the data necessary for analyzing or answering relevant business questions.

- Key Figures
 - Numeric fields representing the objects of analysis in BI reports, such as cost, quantity, unit, etc.
- Characteristic
 - Descriptive fields supplying details about the Key Figures in BI Reports



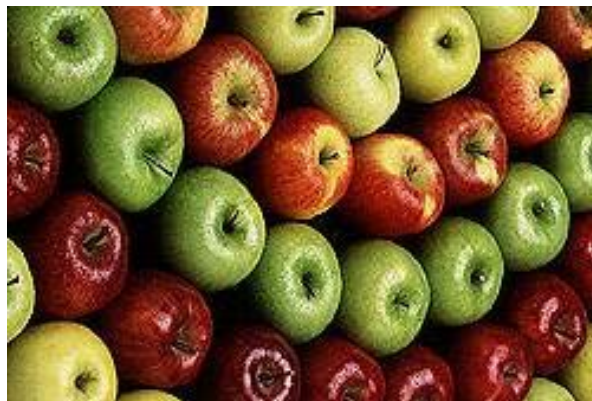


Accessing BI Reports in FMMI



To access BI Reports in FMMI, click on the appropriate process tab:

- Click on the BI Reports tab
- A list of available reports (determined by access and role) will appear as a series of links on the left-hand pane
- Select a report to see a variable entry screen to enter the parameters for the report





Variables



- Once a report is selected, the **Variable Entry** screen will appear and values can be entered for the variables
- Variables are mandatory or optional
 - Mandatory variables are noted with an asterisk to the left of the variable name
- Though optional fields do not require a value to be entered, it is highly recommended that an entry be made to limit the data returned in the report output

Variable Entry

Available Variants: Save Save As... Delete [Show Variable Personalization](#)

General Variables			
	Variable	Current Selection	Description
*	Company Code (Single Value Entry,		
*	Fiscal Year (Single Value Entry, Required)		
*	From Period	1	1
*	To Period	16	16
	G/L Account (Selection Options, Optional)		
*	Fund		
*	Funds Center		

OK Check



Multiple Selection



The **Search** button provides a multiple selection option that allows users to enter multiple values or ranges when parameters are set for a report.

- This feature affords more specification and detail in the report
- Users may choose to select or exclude a single value or select or exclude a range for each parameter
- Users are able to search for the field values using match codes

Available Variants:

Variable	Current Selection	Description
* Company Code (Single Value Entry, Required)		
* Fiscal Year (Single Value Entry, Required)		
* From Period	1	1
* To Period	16	16
G/L Account (Selection Options, Optional)		
* Fund		
* Funds Center		



Select values for Fund (ZVD_M_O_AUTH_FUND 0003)

Show tool: Show view:

Maximum Records:

Fund: Text	Applctn: Key	Customer: Key
<input type="checkbox"/> ARSA Mock3 Default	USDA/#	#
<input type="checkbox"/> ASA Gen APPR	USDA/#	#
<input type="checkbox"/> ASCR Asst Sec CR Dir	USDA/#	#
<input type="checkbox"/> ASCR Asst Sec CR Rei	USDA/#	#
<input type="checkbox"/> ASCR Reimbursable	USDA/#	#
<input type="checkbox"/> Accredited Lab	USDA/#	#
<input type="checkbox"/> Appropriated	USDA/#	#
<input type="checkbox"/> Building & Facility	USDA/#	#
<input type="checkbox"/> CM - Gen Fund (Dir)	USDA/#	#
<input type="checkbox"/> CM - Gen Fund (Reim)	USDA/#	#
<input type="checkbox"/> Collect Cancel Auth	USDA/#	#

Type	Description
------	-------------



Main Screen Elements of BI Reporting



The BI Variable Entry screen includes two main toolbars:

- Variant Toolbar
 - Contains the following components: Available Variants, Save, Save As, and Delete
- Execute Toolbar
 - Contains the following components: OK and Check

**Variant
Toolbar**



**Execute
Toolbar**



Variable Entry

Available Variants: Save Save As... Delete [Show Variable Personalization](#)

General Variables			
	Variable	Current Selection	Description
*	Company Code (Single Value Entry,		
*	Fiscal Year (Single Value Entry, Required)		
*	From Period	1	1
*	To Period	16	16
	G/L Account (Selection Options, Optional)		
*	Fund		
*	Funds Center		

OK Check



Variant Toolbar



- A variant is a collection of saved parameters, like a set of report selection criteria. Use a variant to run similar reports to save time
 - Save values entered into selection fields on a report using variants
 - Use a variant to run similar reports to save time
 - Click the **Save As** button to save the key fields
- Users may create several variants for the same report, each one containing different values
- The Variant toolbar includes the following elements:

Name	Description
Available Variants	Provides a drop-down list of the available variants
Save	Saves updates to an already-existing variant
Save As	Creates a new report variant
Delete	Removes the selected variant from the drop-down list



Hands-on Activity



Create a BI Report Variant

- **Purpose:** Use this procedure to set up a report variant in FMMI
- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User



Execute Toolbar



Once the variables for a given report are entered, use the Execute toolbar to complete the query. The Execute toolbar includes the following elements:

Name	Description
Check	Verifies that the inputted values are valid
OK	Executes the report for the selection criteria entered





BI Report Layout



The following BI screen elements are present across all reports:

USDA United States Department of Agriculture
Financial Management Modernization Initiative

Help | Log Off

Welcome Accounts Payable Accounts Receivable Cost Management Funds Management **General Ledger** Purchasing Ad-hoc

General Ledger Reports

Standard Trial Balance | History Back Forward

Standard trial balance Last Data Update: 10/26/2009 14:56:25

Open Save As... Display As Table Information Print Version Export to Excel Filter Settings

Columns	Fund	G/L Account a.	Beginning Balance	Debit	Credit	Ending Balance
			\$	\$	\$	\$
▼ Key Figures	OCFO Program Reim	USGL/1010230000	0.00	104.99	0.00	104.99
▼ Rows		USGL/1010980000	0.00	0.00	-6.00	-6.00
• Fund		USGL/1310000000	0.00	1.00	0.00	1.00
• G/L Account		USGL/1310900000	0.00	299.99	-99.99	200.00
▼ Free characteristics		USGL/1750003110	0.00	6.00	0.00	6.00
• Applctn		USGL/4210000000	0.00	23,000,000.00	-205.99	22,999,794.01
• Currency		USGL/4221000000	0.00	101.00	0.00	101.00
• Fiscal year		USGL/4252000000	0.00	104.99	0.00	104.99
• Funds Center		USGL/4450000000	0.00	10,130,000.00	-23,130,000.00	-13,000,000.00
		USGL/4590000000	0.00	120.00	-10,000,000.00	-9,999,880.00
		USGL/4610000000	0.00	6.00	-120.00	-114.00
		USGL/4902000000	0.00	0.00	-6.00	-6.00
		USGL/5200000200	0.00	0.00	-300.99	-300.99
		USGL/5200000271	0.00	0.00	-5.00	-5.00
		Result	0.00	33,130,743.97	-33,130,743.97	0.00

Report Title

Report Toolbar

Characteristics and Key Figures

Results Area



BI Report Layout Continued



The four main components of BI reports layout are:

- **Report Title** – The title of the BI report executed
- **Toolbar** – Buttons that facilitate navigation between screens and allow other actions to be performed within the report
- **Characteristics and Key Figures** – List of characteristics (free and default) and key figures available in the report
 - **Rows Menu:** The rows section displays what rows are currently in view for a given report
 - **Free Characteristic Menu:** The free characteristics are fields and values on the left hand pane. Elements under the free characteristics column are not currently in the report but can be added via drag and drop in between any of the columns left of the key figures on the report
- **Results Area** – Actual results returned from BI for the selection criteria entered



Hands-on Activity



Run a BI Report

- **Purpose:** Use this procedure to run a BI report in FMMI

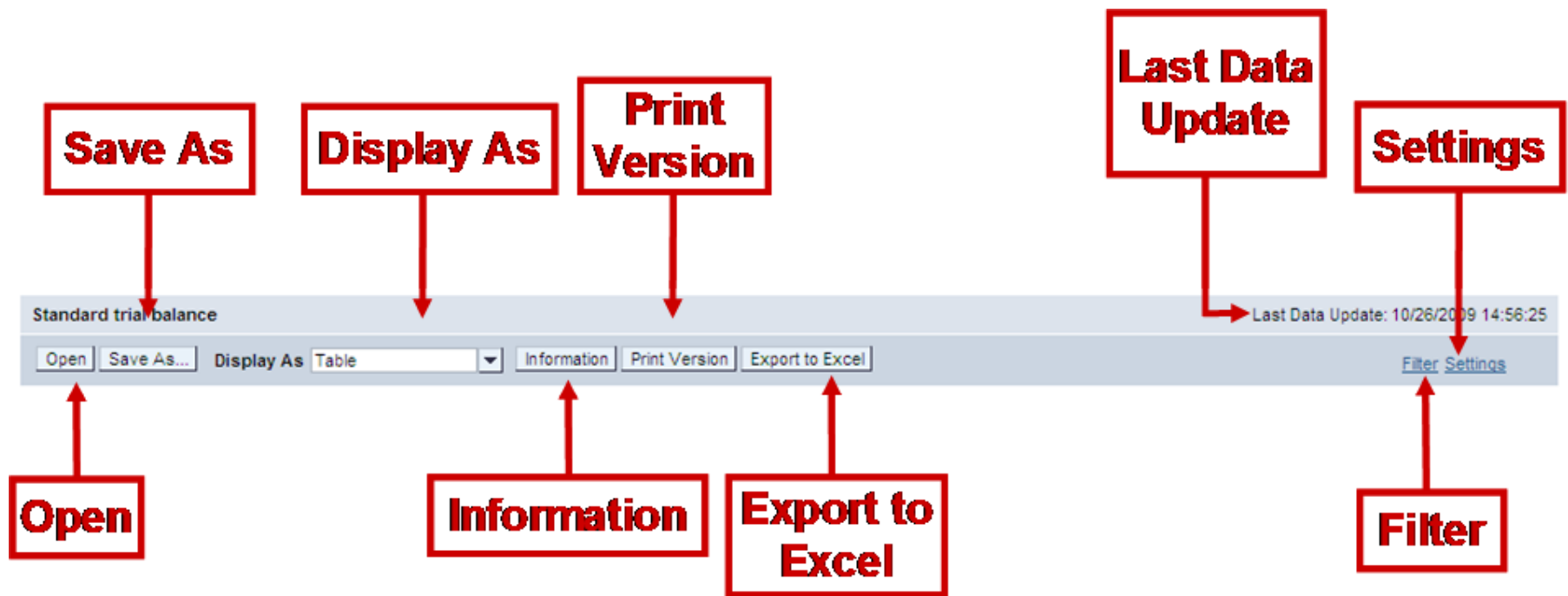
- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User



BI Report Toolbar



The BI Report toolbar contains buttons used to navigate between screens and perform other actions within a report.



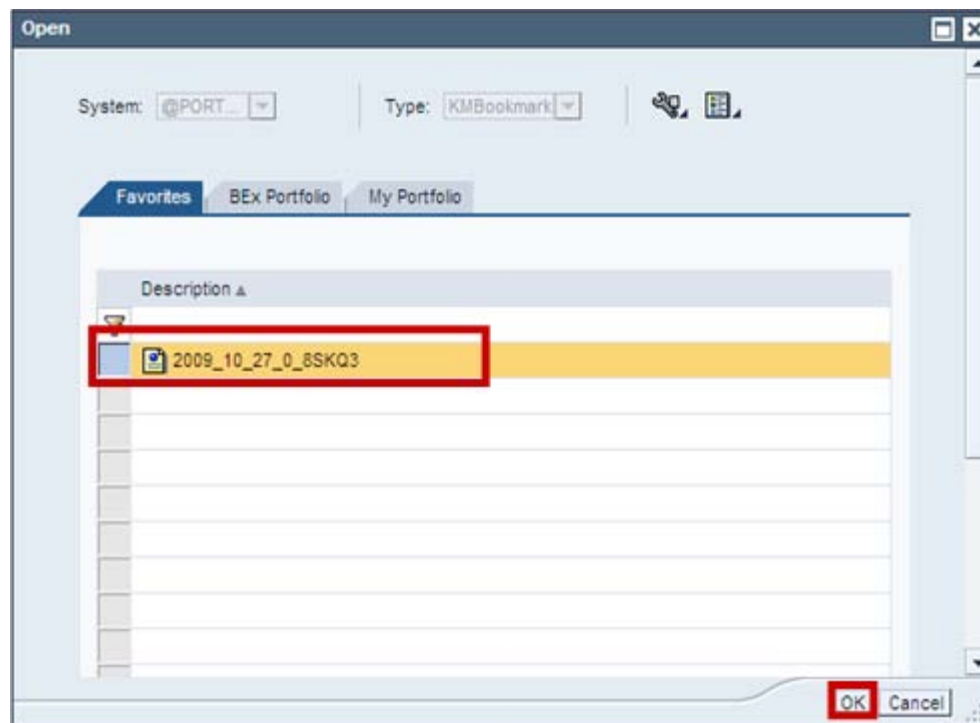


BI Report Toolbar: Open



The **Open** button on the Report toolbar opens a saved report layout. The data contained in the saved report layout is refreshed when it is reopened.

- Select the appropriate report layout to open by highlighting it and clicking the **OK** button



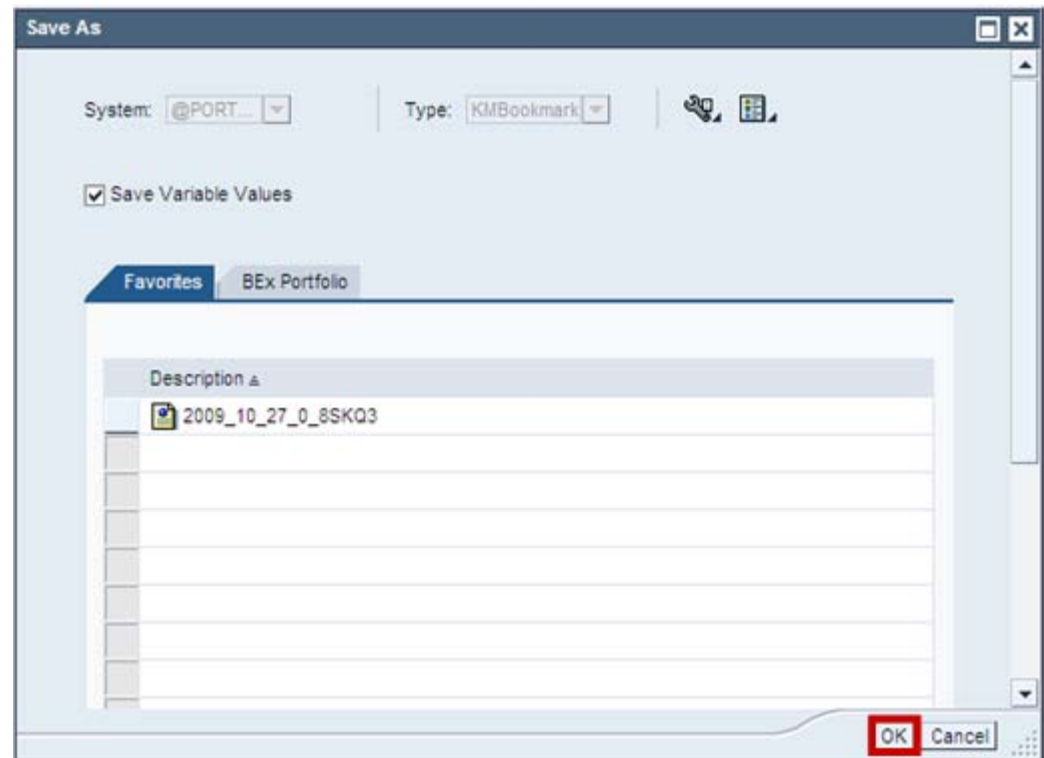


BI Report Toolbar: Save As



The **Save As** button on the Report toolbar saves the report layout as a favorite link. The saved report can be accessed using the **Open** button.

- The Save As window defaults to the Favorites folder, where users can enter a description of the report in the **Description** field (end users may have to scroll down first)
- To save that layout, click the **OK** button

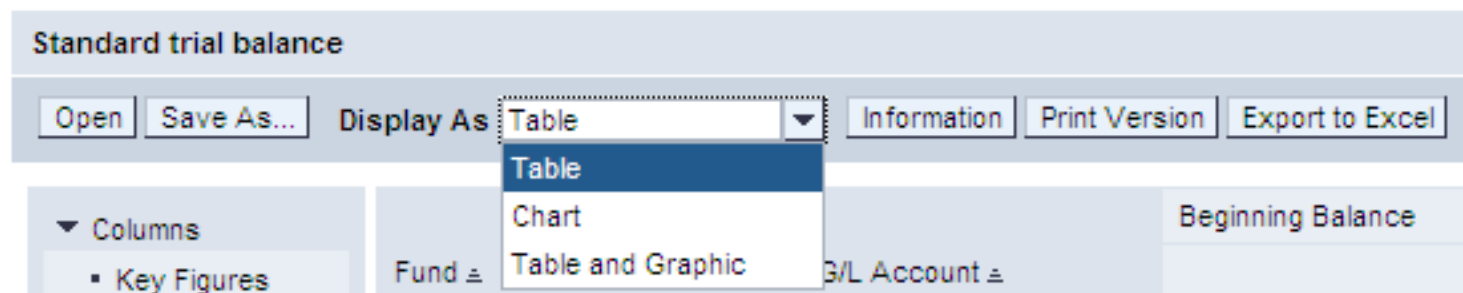




BI Report Toolbar: Display As

The **Display As** button on the Report toolbar enables users to determine how the data will be shown on the screen.

- The information can be displayed as a:
 - Table
 - Chart
 - Both Concurrently





BI Report Toolbar: Information



The **Information** button on the Report toolbar enables users to display query-specific key information, filters, and variables relative to the report.

- Key information about the BI report includes the following:
 - **Key Date:** Date the report data was last refreshed from BI
 - **Changed At:** Date and time the report definition was changed
 - **Last Changed by:** ID of the person who last changed the report definition
 - **Last Refreshed:** Date and time the report was last refreshed
- **Filters:** Data currently being filtered out of the results area of the report
- **Variables:** Selection criteria entered into the **Variable Selection** screen prior to executing the report





BI Report Toolbar: Print Version



The **Print Version** button on the Report toolbar displays report data in a printable Adobe Acrobat document (PDF format)

- The **Export Dialog** window allows users to format the hard copy of the report
- Users are able to modify the margins, header, and footer

The screenshot shows the 'Export Dialog' window with the following settings:

- Scaling Factor:** ☒ Fit to page width, ☐ Fit to page, ☐ Poster. Checkboxes: ☒ Repeat column headers, ☒ Repeat lead columns, ☒ Repeat column headers.
- Page:** Theme: Standard SAP, Size: A4 210 x 297 mm, Orientation: Portrait Format.
- Margins:** in mm. Top: 20.0, Bottom: 20.0, Left: 20.0, Right: 20.0.
- Header:** Left: Date Time, Center: Free Text (UNITED STATES DEPART), Right: Page 1.
- Footer:** Left: None, Center: Free Text (FOR OFFICAL USE ONLY), Right: None.

Buttons: OK, Cancel.

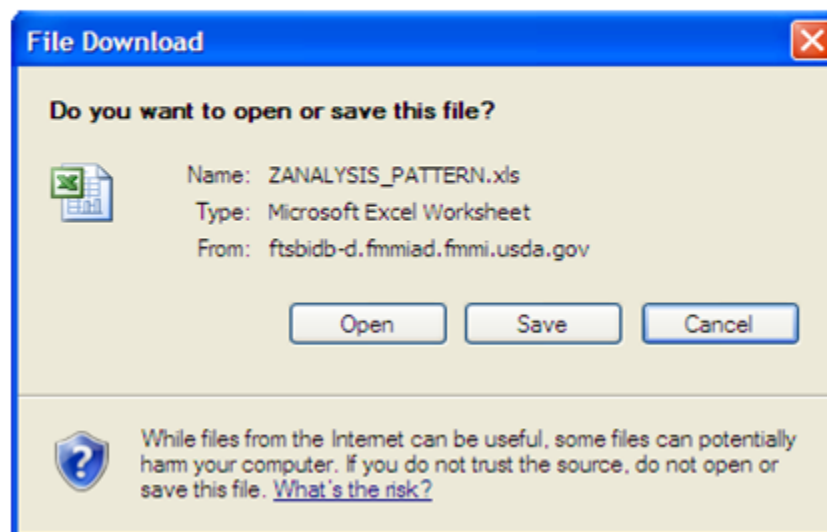
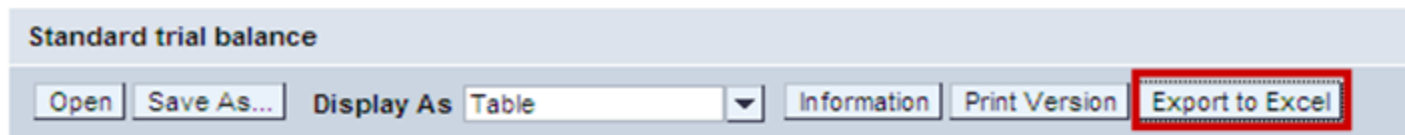


BI Report Toolbar: Export to Excel



The **Export to Excel** button on the Report toolbar exports the report to an Excel worksheet.

- The **Export Dialog** window allows end users to name the Excel file and select where to save it on the desktop





BI Report Toolbar: Filter



The **Filter** link on the Report toolbar displays the filter area which allows users to edit the values of the characteristics for the report.

- The **Variable Screen** button allows users to modify the selection parameters of the report
- For the applicable characteristic, click the drop-down button and select the edit option
- The **Select values** pop-up window displays which allows users to add or remove values for that given characteristic

A screenshot of the BI Report Filter toolbar. It contains several drop-down menus for filtering data. The first row includes "Applctn:", "Currency:", and "Fiscal year:", each followed by a "Show All Values" drop-down menu. The second row includes "Fund:", "Funds Center:", and "G/L Account:", each followed by a "Show All Values" drop-down menu. The third row includes "Key Figures:" followed by a "Show All Values" drop-down menu. At the bottom of the toolbar are three buttons: "Close", "Variable Screen", and "Display All Filter Values".

Applctn:	Show All Values	Currency:	Show All Values	Fiscal year:	Show All Values
Fund:	Show All Values	Funds Center:	Show All Values	G/L Account:	Show All Values
Key Figures:	Show All Values				

Close Variable Screen Display All Filter Values



Hands-on Activity



Filter/Sort a BI Report

- **Purpose:** Use this procedure to filter a BI report in FMMI

- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User

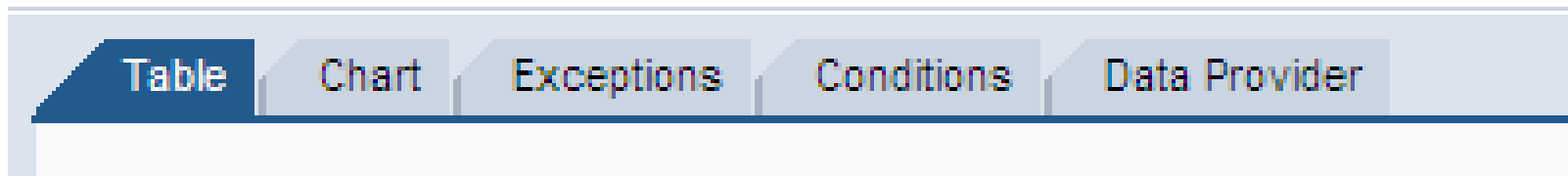


BI Report Toolbar: Settings



The **Settings** link on the Report toolbar allows users to adjust the settings of the report. It contains the following five tabs:

- Table
- Chart
- Exceptions
- Conditions
- Data Provider





Settings: Table



The **Table** tab on the Settings link allows users to adjust the settings of the table displaying the report data.

Table | Chart | Exceptions | Conditions | Data Provider

Layout

- ☒ Alternate Table Row Styles

Cell-Specific Settings

Exception Visualization:

- ☐ Document Icons for Data
- ☐ Document Icons for Metadata
- ☐ Document Icons for Master Data

Data-Specific Settings

- ☐ Display Repeated Texts
- ☒ Display Scaling Factors

Apply Cancel

Close



Settings: Chart



The **Chart** tab on the Settings link allows users to adjust the settings of the Chart displaying the report data.

- This option is applicable when the report display is set to “Chart”
- The **Chart Type** field determines the type of chart used to display the data, such as Pie chart or a Line chart
- The **Chart Legend Position** determines the location of the Chart Legend on the Chart display
- Check the **Manual Axis Description** checkbox and the **Manual Axis Label** to provide descriptions and labels for the X axis and Y axis, respectively

The screenshot shows the 'Settings: Chart' tab interface. It has a top navigation bar with tabs: Table, Chart (selected), Exceptions, Conditions, and Data Provider. The main content area is divided into three sections: Chart Settings, Chart Texts, and Data-Specific Settings. Chart Settings includes dropdowns for Chart Type (Columns), Legend Type (Chart Legend Position), and Chart Legend Position (South). Chart Texts includes checkboxes for Manual Axis Description and Manual Axis Label, each followed by input fields for Category Axis (X), Value Axis (Y), Secondary Category Axis (X), and Secondary Value Axis (Y). Data-Specific Settings includes checkboxes for Swap Display Axes, Display Results, and Show Expanded Hierarchy Nodes. At the bottom are Apply and Cancel buttons.



Settings: Exceptions



The **Exceptions** tab on the Settings link allows users to create an exception to highlight and draw attention to certain outputs such as extremely high or low values.

A screenshot of a web application interface showing the 'Exceptions' tab. The tab is highlighted with a blue border and a dotted outline. Above the tab are four other tabs: 'Table', 'Chart', 'Conditions', and 'Data Provider'. The main content area of the 'Exceptions' tab displays the text 'No exceptions are defined' in a light blue font. Below this text are four buttons: 'Add', 'Details', 'Toggle State', and 'Delete'. At the bottom left of the interface is a 'Close' button.



Settings: Conditions



The **Conditions** tab on the Settings link allows users to create a condition to restrict values that would otherwise be displayed.

A screenshot of a web application interface showing the 'Conditions' tab. The tab is highlighted in blue. Above the main content area are five tabs: 'Table', 'Chart', 'Exceptions', 'Conditions', and 'Data Provider'. The main content area displays the text 'No conditions are defined' in a light blue font. Below this text are four buttons: 'Add', 'Details', 'Toggle State', and 'Delete'. At the bottom left of the interface is a 'Close' button.



Settings: Data Provider



The **Data Provider** tab on the Settings link allows users to adjust the display settings of the report data.

- For examples, users can modify the display of the (-) sign or the display of zeros
- Users can also choose to suppress 0 values in the columns and/or rows

The screenshot shows a software interface with a tabbed menu at the top: Table, Chart, Exceptions, Conditions, and Data Provider (which is selected). Below the tabs, there are two main sections:

- Data Formatting:**
 - Result position: Bottom / Right (dropdown menu)
 - ☐ Display columns hierarchically and...
 - ... drilldown to: Key Figures (dropdown menu)
 - ☐ Display rows hierarchically and...
 - ... drilldown to: Fund (dropdown menu)
 - Buttons: Apply, Cancel
- Size Restriction for Result Sets:**
 - Maximum No. of Cells for Result Set: Default No. (500000 Cells) (dropdown menu)

A Close button is located at the bottom left of the settings panel.



Hands-on Activity



Modify BI Report Settings

- **Purpose:** Use this procedure to adjust BI report settings in FMFI
- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User



OLAP Reporting: Context Menu



Online Analytical Processing (OLAP) functionality provides the ability to manipulate data in the report output.

- By using the Context Menu, users are able to perform several different functions
 - The Context Menu contains functions such as drilling-down, filtering, and sorting data
 - To access the Context Menu, right-click the mouse somewhere on the report



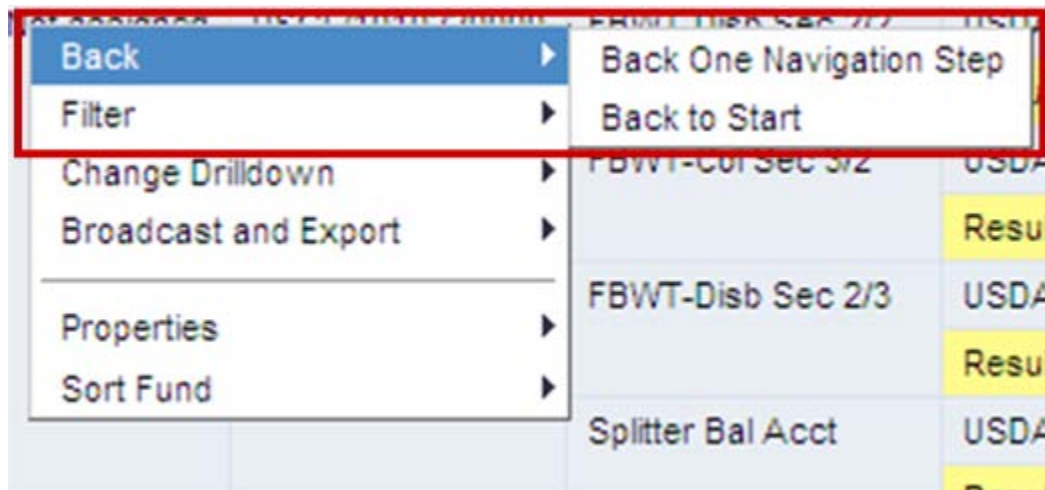


Context Menu: Back



The Context Menu changes depending on where a user is on the screen. Although some features will remain constant, others will change.

- **Back** – Appears once a change has been made to the report output
 - Back One Navigation Step – Go back one step
 - Back to Start – Return the original results from when the report was first executed





OLAP Reporting: Goto



The Goto functionality allows end users to execute reports that are related to their current report.

- For example, a user who is viewing the Transaction Register results screen can attain additional details by executing the Transaction Register – Detail report using the Goto function
- This option is not available for all BI reports. For example, the Detail Trial Balance (BP) report does not have the Goto functionality available

Goto	Transaction Register - Detail
Filter	
Change Drilldown	Result
Broadcast and Export	001/2010 CF0
Properties	
Sort Commitment item	Result
	001/2010 CF0

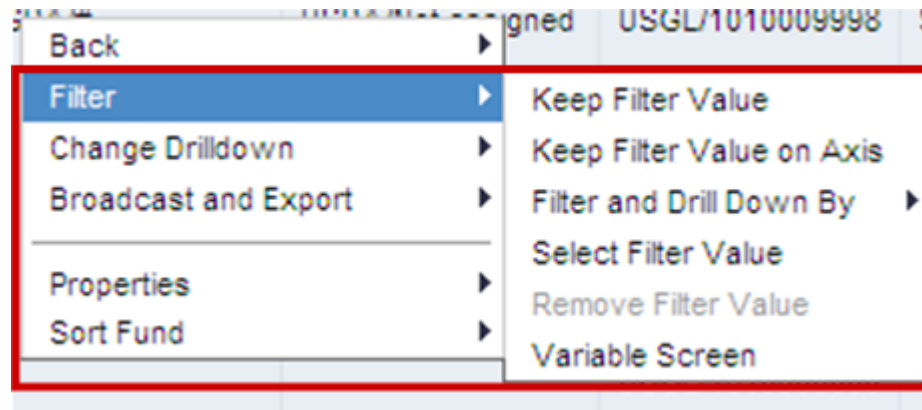


OLAP Reporting: Filtering



The Filter option in the Context Menu provides users with the following selections for filtering data in the report output:

- **Keep Filter Value** – Filters report results on specific value(s) for data elements contained in the report. Keep Filter Value removes the value the report is filtered on from the results area of the report
- **Keep Filter Value on Axis** – Filters on a Characteristic within the Results Area of the report while adjusting the filter value to the axis
- **Filter and drilldown By** – Adds the selected Free Characteristic to the report and filters on this Characteristic





OLAP Reporting: Filtering Continued



The Filter option in the Context Menu provides users with the following selections for filtering data in the report output:

- **Remove Filter Value** – Removes a filter from the report
- **Select Filter Value** – Limits the amount of data displayed in the report based on the selected filter
- **Variable Screen** – Displays the Variable Entry screen where variables can be entered or removed to modify the report output





OLAP Reporting: Drilldown Capability



- Drilling-down in BI Reports enables users to navigate to a more detailed level:
 - Occurs by adding characteristics to the row and/or columns
 - Reports data according to its Characteristics and Key Figures
 - Enables users to investigate data at a lower level of data
- Drilling-down in BI reports is different from drilling down in ECC reports. In an ECC report, users can drill-down to a specific transaction and/or document. In a BI report, users can drill-down using additional characteristics

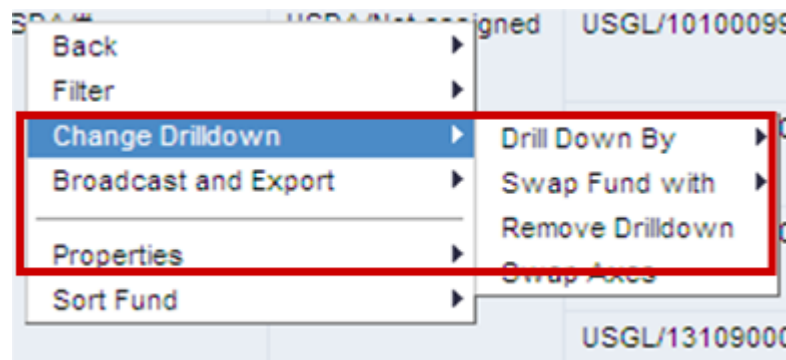


OLAP Reporting: Drilldown Capability Continued



The Change Drilldown option in the Context Menu provides users with the following selections for drilling down data in the report output:

- **Drill Down By** – Adds the selected characteristic within the results area of the report
- **Swap [Characteristic] with** – Swaps position of a characteristic with another characteristic within the results area of the report
- **Remove Drilldown** – Removes a characteristic from the results area of the report
- **Swap Axes** – Changes the display of a characteristic from vertical (columns) to horizontal (rows) or vice versa in the results area of the report





The screenshot displays the Financials application interface. The top section shows a table with columns: Fund, G/L Account, and Application. The table contains several rows, including 'USDA/Not assigned' and 'USGL/1010009998'. A red box highlights the 'Filter and Drill Down By' menu, which is open, showing options like 'Keep Filter Value', 'Filter and Drill Down By', 'Select Filter Value', 'Remove Filter Value', and 'Variable Screen'. Another red box highlights the 'Change Drilldown' menu, which is also open, showing options like 'Swap Axes', 'Broadcast and Export', and 'Properties'. The bottom section shows a table with columns: Debit, Credit, and Ending Balance. The table contains several rows, including 'USGL/1511000000' and 'OMS-Held for Use'. A red box highlights the 'Change Drilldown' menu, which is open, showing options like 'Swap Axes', 'Broadcast and Export', and 'Properties'.

Fund	G/L Account	Application
USDA/Not assigned	USGL/1010009998	Splitter Bal Acct
USDA/Not assigned	USGL/1010230000	FRWT-Col Sec 3/2
USDA/Not assigned	USGL/1511000000	OMS-Held for Use

Debit	Credit	Ending Balance
\$ 0.00	\$ 579.79	\$ -1,150.58
\$ 1,150.58	\$ 579.79	\$ 579.79
\$ -465,639.28	\$ 175,223.28	\$ 175,223.28
\$ -579.79	\$ 579.79	\$ 579.79
\$ -579.79	\$ 579.79	\$ 579.79



Drilldown Capability: Drag and Drop



While in a report, the column on the left hand side lists a series of different characteristics (“Free Characteristics”) that may be added to the report.

- To add a particular characteristic to the report, click on that characteristic and drag it by holding down on the left mouse button
- Move the cursor to the point to add the characteristic in the report
- Drop (release the left mouse button) in between whichever columns you would like left of the key figures
- After dragging and dropping the applicable characteristic into the report, an additional column will appear that displays that characteristic's data





Drilldown Capability: Drag and Drop Example



After dragging and dropping “Funds Center” into the report, an additional column will appear titled “Funds Center” and will contain funds center data.

Standard trial balance

Open Save As... Display As Table Information Print Version Export to Excel

Columns: Key Figures
Rows: Fund, G/L Account, Free characteristics: Applctn, Currency, Fiscal year, **Funds Center**

Fund: USDA/CF0000014D OCFO Direct

G/L Account a	FBWT	Beginning Balance	Debit
USGL/1010000000	FBWT	0.00	90,373
USGL/1010220000	FBWT-Sub Sec 2/2	0.00	
USGL/1010320000	FBWT-Sub Sec 2/3	0.00	
USGL/1010980000	Cost Trn/OH Offset	0.00	
USGL/1090000000	FBWT-ContResol	0.00	
USGL/1310000000	Accounts Receivable	0.00	
USGL/1310900000	AR-SD Recon	0.00	
USGL/1340000000	Interest Receivable	0.00	

Additional Column: Funds Center

Columns: Key Figures
Rows: Fund, G/L Account, Funds Center, Free characteristics: Applctn, Currency, Fiscal year

Fund: OCFO Program Reim

G/L Account a	Funds Center	Beginning Balance	Debit	Credit	Ending B
USGL/1010230000	OCFO	0.00	104.99	0.00	
	Result	0.00	104.99	0.00	
USGL/1010980000	OCFO	0.00	0.00	-6.00	
	Result	0.00	0.00	-6.00	
USGL/1310000000	OCFO	0.00	1.00	0.00	
	Result	0.00	1.00	0.00	
USGL/1310900000	OCFO	0.00	299.99	-99.99	
	Result	0.00	299.99	-99.99	
USGL/1750003110	OCFO	0.00	6.00	0.00	
	Result	0.00	6.00	0.00	
USGL/4210000000	OCFO	0.00	23,000,000.00	-205.99	
	Result	0.00	23,000,000.00	-205.99	
USGL/4221000000	OCFO	0.00	101.00	0.00	
	Result	0.00	101.00	0.00	
USGL/4252000000	OCFO	0.00	104.99	0.00	
	Result	0.00	104.99	0.00	
USGL/4450000000	OCFO	0.00	10,130,000.00	-23,130,000.00	



Drilldown Capability: Removing Characteristics



To remove characteristics that are displayed in a report:

- Go to the Rows Menu on the left hand side and select the value for removal
- Drag (hold down left mouse button) that value into the Free Characteristics Menu and drop (release left mouse button) it there
- After removing the applicable characteristic from the report, the column that displays that characteristic's data disappears

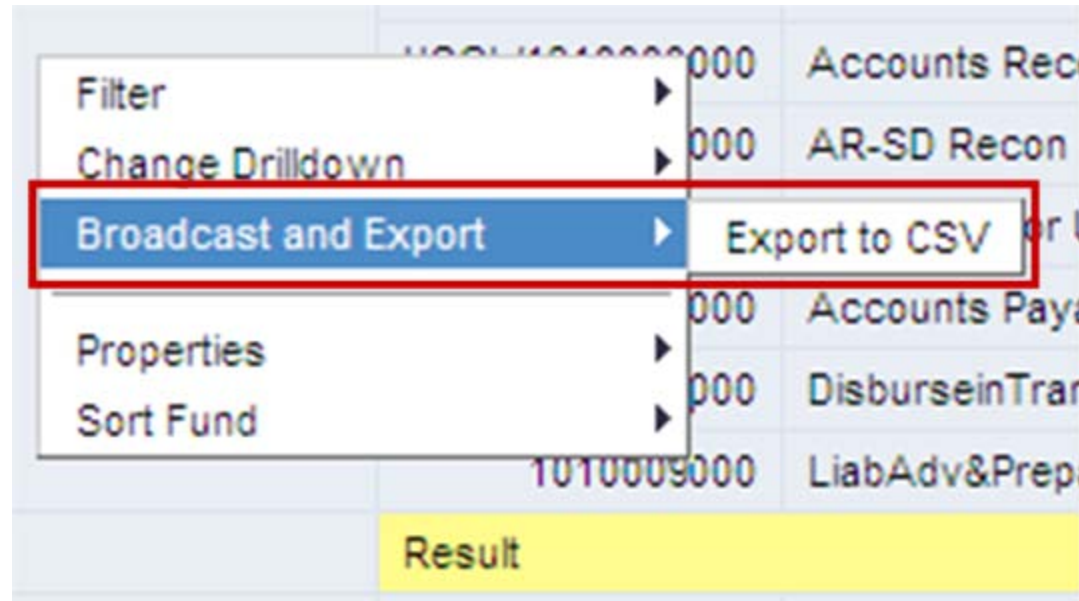
	Fund	G/L Account a.	Funds Center	Beginning Balance	Debit	Credit	Ending B
				\$	\$	\$	
	OCFO Program Reim	USGL/1010230000	OCFO	0.00	104.99	0.00	
			Result	0.00	104.99	0.00	
		USGL/1010980000	OCFO	0.00	0.00	-6.00	
			Result	0.00	0.00	-6.00	
		USGL/1310000000	OCFO	0.00	1.00	0.00	
			Result	0.00	1.00	0.00	
		USGL/1310900000	OCFO	0.00	299.99	-99.99	
			Result	0.00	299.99	-99.99	
		USGL/1750003110	OCFO	0.00	6.00	0.00	
			Result	0.00	6.00	0.00	
		USGL/4210000000	OCFO	0.00	23,000,000.00	-205.99	
			Result	0.00	23,000,000.00	-205.99	
		USGL/4221000000	OCFO	0.00	101.00	0.00	
			Result	0.00	101.00	0.00	
		USGL/4252000000	OCFO	0.00	104.99	0.00	
			Result	0.00	104.99	0.00	
		USGL/4450000000	OCFO	0.00	10,130,000.00	-23,130,000.00	



Context Menu: Broadcast and Export



- Use the **Broadcast and Export** function to export report results to a CSV (Comma Separated Value) file
 - Select the **Export to CSV** option on the Context Menu
 - A File Download pop-up box displays
 - Click the **Save** button
 - Specify a file name and location for the report
 - The file saves in the specified location

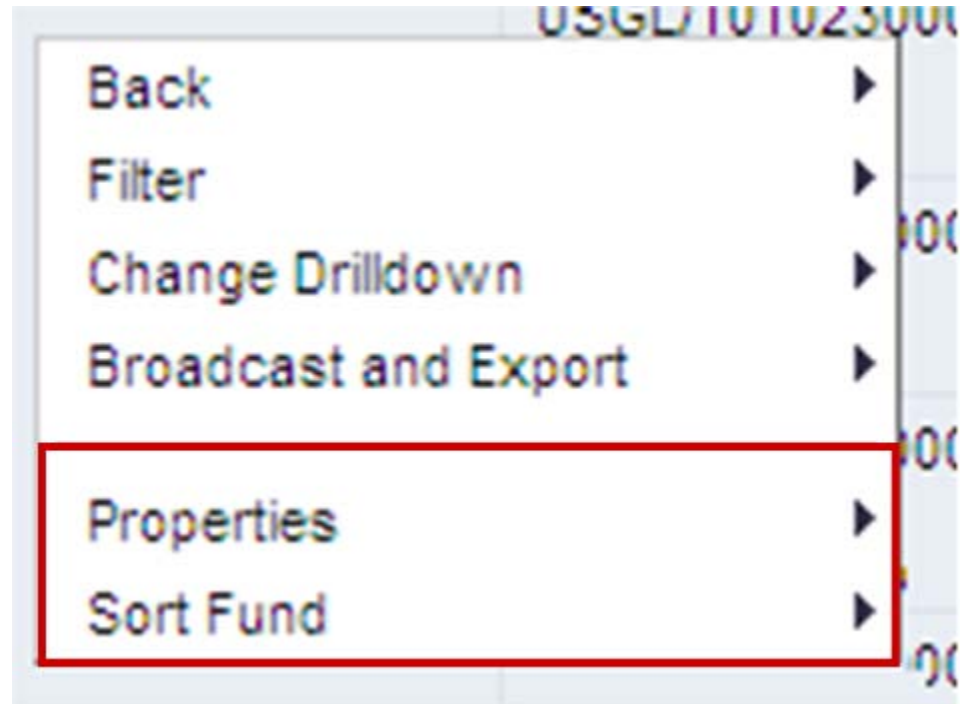




Context Menu: Properties and Sort



- Use the Properties function to view or modify the properties for:
 - Characteristic
 - Data Cell
 - All Data Cells
 - Axis
- Use the Sort function to change the data within the results area of the report (in this example, the characteristic clicked on to sort is G/L Account)





Hands-on Activity



Adjust BI Report Layout

- **Purpose:** Use this procedure to adjust the layout of a BI report in FMMI

- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User



Condition



A condition allows a key figure value to be restricted that would otherwise be displayed, such as the top ten values, the top five percent values, or all values above or below a certain level.

- Results will be returned according to the condition values defined
- To create a condition, perform the following steps:
 - Click the **Settings** link on the Report toolbar
 - Click the **Conditions** tab
 - Click the **Add** button
 - On the Define Condition window, complete the outlined steps





Exception



An exception is used to highlight and draw attention to certain results in the report output such as extremely high or low values of a key figure. Results will be returned according to the condition values defined.

- Results will be highlighted according to the exception values and levels defined
- To create an exception, perform the following steps:
 - Click the **Settings** link on the Report Toolbar
 - Click the **Exception** tab
 - Click the **Add** button
 - On the Define Exception window, complete the outlined steps



Saving a BI Report



- After establishing the desired layout for a particular report, save that view for future use
 - Click the **Save As** button on the BI Report Toolbar
 - On the pop-up screen, select the **Favorites** tab
 - In the **Description** field, name the layout to reference it in the future
 - Click the **OK** button





Hands-on Activity



Save a BI Report

- **Purpose:** Use this procedure to save a BI report in FMMI

- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User



Opening a BI Report



- Once saved, access this report by clicking the **Open** button on the BI Report toolbar
 - On the pop-up screen, the saved report will be displayed
 - Highlight the appropriate link and click the **OK** button
 - The **Variable Entry** screen displays with the original inputted parameters
 - Click the **OK** button
 - The report automatically displays in its saved layout





Exporting a BI Report



- After manipulating the report as necessary, the user can export that report to MS Excel.
 - Click the **Export to Excel** button on the BI Report toolbar
 - A File Download pop-up box displays
 - Click the **Save** button
 - Specify a file name and location for the report
 - Click the **Save** button to save it in the specified location
- End users should note that when first attempting to export the results, they are sent back to the **Welcome** screen in FMMI
 - Once they run the report a second time, they are able to export the report normally. Since USDA users are not Administrators of their computers, they do not have access to change their Internet Explorer security settings to avoid this issue. To avoid this issue, users with the proper access can turn off their computer's pop-up blocker



Exporting a BI Report Continued



Exporting BI reports enables users to save a local copy of any generated report for future viewing.

- Note the report filters at the bottom of the excel file. End Users need to reference this information about the report to provide the necessary context of the data

Standard trial balance

Last Data Update: 10/26/2009 14:56:25

New Analysis Open Save As... Display As Table Information Send Print Version **Export to Excel** Com

Columns

- Key Figures

Rows

- Fund
- G/L Account

Free characteristics

- Applctn
- Currency
- Fiscal year
- Funds Center

Fund	G/L Account a	Beginning Balance	Debit	Credit
OCFO Program Reim	USGL/1010230000	0.00	104.99	
	USGL/1010980000	0.00	0.00	
	USGL/1310000000	0.00	1.00	
	USGL/1310900000	0.00	299.99	
	USGL/1750003110	0.00	6.00	
	USGL/4210000000	0.00	23,000,000.00	
	USGL/4221000000	0.00	101.00	
	USGL/4252000000	0.00	104.99	
	USGL/4450000000	0.00	10,130,000.00	
	USGL/4590000000	0.00	120.00	
	USGL/4610000000	0.00	6.00	
	USGL/4902000000	0.00	0.00	
	USGL/5200000200	0.00	0.00	
	USGL/5200000271	0.00	0.00	
Result		0.00	33,130,743.97	

Microsoft Excel - OANALYSIS_PATTERN[1].xls

Standard trial balance

Fund	G/L Account	Beginning Balance	Debit	Credit	Ending Balance
OCFO Program Reim	USGL/1010230000	0.00	104.99	0.00	104.99
OCFO Program Reim	USGL/1010980000	0.00	0.00	-8.00	-8.00
OCFO Program Reim	USGL/1310000000	0.00	1.00	0.00	1.00
OCFO Program Reim	USGL/1310900000	0.00	299.99	-99.99	200.00
OCFO Program Reim	USGL/1750003110	0.00	6.00	0.00	6.00
OCFO Program Reim	USGL/4210000000	0.00	23,000,000.00	-205.99	22,999,794.01
OCFO Program Reim	USGL/4221000000	0.00	101.00	0.00	101.00
OCFO Program Reim	USGL/4252000000	0.00	104.99	0.00	104.99
OCFO Program Reim	USGL/4450000000	0.00	10,130,000.00	-23,130,000.00	-13,000,000.00
OCFO Program Reim	USGL/4590000000	0.00	120.00	-10,000,000.00	-9,999,880.00
OCFO Program Reim	USGL/4610000000	0.00	6.00	-120.00	-114.00
OCFO Program Reim	USGL/4902000000	0.00	0.00	-8.00	-8.00
OCFO Program Reim	USGL/5200000200	0.00	0.00	-300.99	-300.99
OCFO Program Reim	USGL/5200000271	0.00	0.00	-5.00	-5.00
OCFO Program Reim	Result	0.00	33,130,743.97	-33,130,743.97	0.00

Ready NUM



Hands-on Activity



Export a BI Report

- **Purpose:** Use this procedure to export a BI report in FMFI

- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User

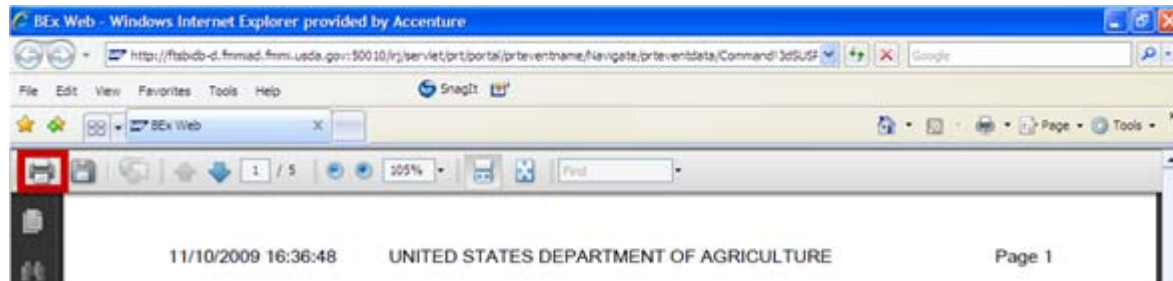


Printing a BI Report



After manipulating the report as necessary, the end user can also print the report. The report displays in a PDF version when printing.

- To print reports in the BI, click the **Print Version** button on the BI Report toolbar
- After clicking this button, a PDF version of the report automatically opens
- To print the report, click the **Print** button in the upper left hand corner
- Alternatively, you can go to the File Menu and select Print





Printing a BI Report Continued



Printing BI reports enables users to produce concrete copies of reports. Files are converted to Adobe Acrobat PDFs prior to printing.

BEx Web - Windows Internet Explorer provided by Accenture

http://ftsibdb-d.fmmiad.fmmi.usda.gov:50010/rj/servlet/prt/portal/prteventname/Navigation/prteventdata/Command!3dSUSF

11/10/2009 16:36:48 UNITED STATES DEPARTMENT OF AGRICULTURE Page 1

Standard trial balance

Fund	G/L Account	Beginning Balance	Debit	Credit	Ending Balance
		\$	\$	\$	\$
Collect Cancel Auth	USGL2980000000	0.00	0.00	-200.00	-200.00
	USGL3310000000	0.00	200.00	0.00	200.00
	Result	0.00	200.00	-200.00	0.00
Gen Fund Prop Int	USGL2980000000	0.00	1,098.64	-1,975.49	-876.85
	USGL3310000000	0.00	1,975.49	-1,098.64	876.85
	Result	0.00	3,074.13	-3,074.13	0.00
Miscellaneous Fines	USGL2980000000	0.00	12.08	-438.13	-426.05
	USGL3310000000	0.00	438.13	-12.08	426.05
	Result	0.00	450.21	-450.21	0.00
OCFO Direct	USGL1010000000	0.00	90,337,383,140.80	-1,000.00	90,337,382,140.80
	USGL1010220000	0.00	0.00	-500.00	-500.00
	USGL1010320000	0.00	2,346.52	-16,811.61	-14,465.09
	USGL1010980000	0.00	12.00	-6.00	6.00
	USGL1090000000	0.00	10,000,200.00	0.00	10,000,200.00
	USGL1310000000	0.00	0.00	-500.00	-500.00



Hands-on Activity



Print a BI Report

- **Purpose:** Use this procedure to print a BI report in FMMI

- **Roles:**
 - BI Reporter
 - BI Payroll Reporter
 - BI Power User
 - BI Payroll Power User



Learning Checkpoint Question and Answer (Q&A)



- Now is your opportunity to see if you are learning the course material
- In the event that you answer a question incorrectly, it is recommended that you reference the key concepts within the course for additional explanation





Learning Checkpoint Question and Answer (Q&A)



1. **True/False:** Mandatory variables are noted with an asterisk to the left of the variable name. *(True)*
2. **True/False:** Unlike ECC reports, users cannot use the asterisk symbol as a wildcard character when searching for information in BI. *(False)*
3. **Multiple Choice:** Which of the following tabs allows user to suppress 0 values in the columns and/or rows?
 - a. Table
 - b. *Data Provider*
 - c. Chart
 - d. Exceptions
 - e. Conditions



Learning Checkpoint Question and Answer (Q&A)



4. **True/False:** In a BI report, users can drill down to a specific transaction/document. *(False)*
5. **True/False:** The Goto functionality allows users to execute reports that are related to their current report. *(True)*



Module Summary



In this module, you have learned to:

- Navigate through the FMMI Portal to BI reports
- Navigate within BI reports
- Explain Online Analytical Processing (OLAP) functionality
- Create a report variant
- Export a report to MS Excel
- Save and print reports





Module Completion



Congratulations! You have completed Module 2 – FMMI BI Navigation. The next module provides a course summary.





Course Outline



- Course Introduction
- Module 1 – FMMI BI Overview
- Module 2 – FMMI BI Navigation
- **Course Summary**
- Course Evaluation



Course Summary



In this course, you have learned to:

- Explain the concept and components of FMMI Business Intelligence (BI)
- Explain BI capabilities and associated benefits
- Define BI key terminology
- Explain BI data architecture
- Access and execute BI reports



Course Outline



- Course Introduction
- Module 1 – FMMI BI Overview
- Module 2 – FMMI BI Navigation
- Course Summary
- **Course Evaluation**



Course Evaluation



- In our efforts to continuously improve FMMI Training, please complete the course evaluation
- The FMMI team uses the results of evaluations to determine the overall effectiveness of the training program and to identify improvements for future sessions
 - Your answers will remain confidential but you may also provide your name if desired
- The evaluation can be accessed at the following link:

[Course Survey](#)

